AMENDMENTS TO THE SPECIFICATION:

Page 1, before line 5, insert the following as a separate paragraph:

This application is a division of Application No. 10/028,992, filed December 28, 2001, the entire content of which is hereby incorporated by reference in this application.

Paragraph beginning at page 2, line 10 has been amended as follows:

Among them, the prior art technology using Ag aims at solving the problem that results from Ag, and the prior art technology using Ni aims at solving the problem of the superheating of Ni that is peculiar to Ni. However, these materials are ~~expansive~~expensive and, as long as these materials are used, it will be difficult to ~~satisfy the requirement for the reduction of~~reduce the production cost of the laminate type dielectric device that has been widely ~~been~~ used.

Paragraph beginning at page 5, line 2 has been amended as follows:

According to a first aspect of the present invention, there is provided a laminate type dielectric device formed by alternately laminating dielectric ceramic layers and electrode layers, wherein the electrode layers ~~is~~are mainly made of an electrically conductive base metal material having greater standard Gibbs free energy of the formation of metal oxides at a baking temperature than that of ceramic materials constituting the dielectric ceramic layers, and segregation of

materials inclusive of the electrically conductive base metal material does not occur at a portion sandwiched between adjacent positive and negative electrode layers in the dielectric ceramic layers.

Paragraph beginning at page 5, line 15 has been amended as follows:

The term "portion sandwiched between the adjacent positive and negative electrode layers in the dielectric ceramic layers" represents the region that is sandwiched between the overlapping portion when the positive electrode layer and the negative electrode layer are seen in the laminating direction. When the positive or negative electrode layer has a portion that does not operate as the electrode due to its discontinuity, a portion of the dielectric portion opposing the former portion does not correspond to the portion sandwiched between the electrode layers described below.

Paragraph beginning at page 5, line 26 has been amended as follows:

The term "segregation" of the material inclusive of the electrically conductive base metal material described above represents the condition in which the electrically conductive base metal having intensity of at least 60% is not detected inside the dielectric ceramic layers with respect to the intensity of the electrically conductive base metal in the electrode layers when component analysis is conducted for the electrode layers and the dielectric ceramic layers by EPMA,

respectively. The substance detected in this case is not particularly limited to the metal (inclusive of the case where the substance is detected as the component element). The term "intensity" represents the detection intensity by an electronic probe micro-analyzer (EPMA), and the term "intensity of at least 60%" may correspond well to an intensity ratio under the following apparatus condition:

acceleration voltage: 20kV
probe current: $1x10^{7}$ A
probe diameter: 1 μm
Dwell (ms): 20 ms
Interval (μm): 0.58 μm x 0.58 μm (corresponding to 700X)
number of pixels: 256 x 256 pixels (corresponding to 700X)
Next, the function and effect of the present invention will be explained.

Paragraph beginning at page 6, line 15 has been amended as follows:

In the laminate type dielectric device according to the present invention, the electrode layers ~~is~~ are made of an electrically conductive base metal material having a greater standard Gibbs free energy for forming a metal oxide at a baking temperature than that of the ceramic material, as its principal component.

Paragraph beginning at page 6, line 21 has been amended as follows:

It is noteworthy in the present invention that segregation of the material inclusive of the electrically conductive base material inside the dielectric ceramic layers, that becomes a problem when at least a part of the conductive base metal

material is oxidized, or during a process in which a temperature becomes higher than a eutectic point of an oxide of the conductive base metal material and a part of the ceramic material such as when oxidation of the conductive base metal material temporarily occurs in a baking process, does not occur.

Paragraph beginning at page 6, line 31 has been amended as follows:

Consequently, even when the atmosphere at the time of baking that satisfies the conditions of both ceramic material and conductive base metal material is somewhat adjusted towards the oxidation side in comparison with the prior art condition to invite a temporary oxidizing atmosphere, segregation due to the oxidation of the electrode material does not occur, reduction of the ceramic material can be suppressed, and the drop of performance of the dielectric ceramic layers can be prevented. Segregation of the electrode material occurs inside the dielectric ceramic layers when the conventional electrode materials are used, and the occurrence of the drop of characteristics of the dielectric ceramic layers and its cracks become the problem because the electrode material does not have the original characteristics.

Paragraph beginning at page 7, line 10 has been amended as follows:

Those metals which can secure electric conductivity even when oxidized can be used as the electrically conductive base metal material constituting the

electrode layers described above. In this way, performance of the electrode layers itself can be secured.

Paragraph beginning at page 7, line 15 has been amended as follows:

Therefore, the present invention can provide a laminate type dielectric device capable of sufficiently exploiting the characteristics of the dielectric ceramic layers by using an economical base metal material for the electrodes.

Paragraph beginning at page 7, line 24 has been amended as follows:

According to a third aspect of the invention, a bonding layer made of a material that keeps the dielectric characteristics of the dielectric ceramic layer is preferably interposed between one of the dielectric ceramic layers and one of the electrode layers. Here, the material for keeping the dielectric characteristics of the dielectric ceramic layer does not establish insulation between the electrode layer and the ceramic layer, though it does not have the properties equivalent to those of the dielectric ceramic layer. It is of importance that the material does not at all form an insulating layer, but a material that insulates electric conductivity may well be distributed as long as it does not prevent continuity of the electrode/bonding layer/ceramic layer.

Paragraph beginning at page 8, line 12 has been amended as follows:

According to a fifth aspect of the invention, the bonding layer is preferably constituted such that Ca is diffused into the dielectric ceramic layers. In this case, too, the effect of keeping the dielectric characteristics of the dielectric ceramic layers described above can be easily acquired.

Paragraph beginning at page 8, line 18 has been amended as follows:

According to a sixth aspect of the invention, the conductive base metal material is preferably any one of Cu, Ni, a mixture of Cu and Ni, and/or their alloys. These base metals are economical and have excellent conductivity. Further, their oxides have excellent conductivity. Therefore, these base metal materials can be used for the electrode layers. In any case, the metals satisfying the standard may be used as a mixture.

Paragraph beginning at page 8, line 34 has been amended as follows:

According to a seventh aspect of the invention, at least one of the dielectric ceramic layers is preferably made of PZT as an oxide mainly having a Pb(Zr, Ti)O_3 perovskite structure. This PZT exhibits extremely excellent characteristics as a dielectric and is suitable for the dielectric layer.

Paragraph beginning at page 9, line 2 has been amended as follows:

According to an eighth aspect of the invention, when at least one of the dielectric ceramic layers is made of PZT, the conductive base metal material is preferably any one of Cu, a mixture of Cu and Ni and their alloys. The dielectric consisting of the $Pb(Zr, Ti)O_3$ as the principal component can be applied limitedly to the metals that are more difficult to oxidize than PbO that remains due to variance of the composition or is added for low temperature baking. At this time, Ni is not suitable because it is more oxidizable than Pb. When Ni is used as a mixture, a Ni oxide may partially be formed. However, the formation of the oxide is not remarkable due to the formation of the Ni-Cu alloy, and the reduction of PbO can be mitigated, too.

Paragraph beginning at page 22, line 25 has been amended as follows:

Next, a thirty-first aspect of the invention provides a laminate type dielectric device formed by alternately laminating dielectric ceramic layers and electrode layers, wherein the electrode layers ~~is~~ are made of an electrically conductive base metal material having a greater standard Gibbs free energy for the formation of a metal oxide at a baking temperature than that of a ceramic material constituting mainly the dielectric ceramic layers, and wherein, when a reference straight line orthogonally crossing any one of the dielectric ceramic layers and two electrode layers above and below the dielectric ceramic layer is assumed, a portion containing a Ca amount per unit volume greater than A+B, where A is a Ca

amount per unit volume contained at a center point at the center of the dielectric ceramic layer between the two electrode layers in a thickness-wise direction and B is a Ca amount per unit volume contained in either ~~an upper or lower~~ the above or below one of the electrode layers, exists on the reference straight line connecting the electrode layer containing B to the center point.

Paragraph beginning at page 23, line 8 has been amended as follows:

In the present invention, the constituent element Ca exists concentratedly at the boundary portion between one of the electrode layers and one of the dielectric ceramic layers. The existence of the component element Ca restricts diffusion and segregation of the electrode material into the dielectric ceramic layer, or improves the bonding strength between the electrode layer and the dielectric ceramic layer.

Paragraph beginning at page 23, line 16 has been amended as follows:

Due to restriction of diffusion and segregation of the electrode material into the dielectric ceramic layers, it is possible to obtain ~~a~~ dielectric ceramic layers having excellent performance.

Paragraph beginning at page 23, line 20 has been amended as follows:

It should be particularly noted hereby that the present invention can be distinguished from the case where the component element Ca is in advance

contained in the dielectric ceramic layers, from the distribution of the component element Ca in the product.

Paragraph beginning at page 23, line 25 has been amended as follows:

The effect described above cannot be obtained when the material to which the component element Ca is added in advance to the dielectric ceramic layers, such as (Pb, Ca) $(ZrTi)O_3$ is used, and Ca is uniformly distributed in this case.

Paragraph beginning at page 23, line 30 has been amended as follows:

Next, a thirty-second aspect of the invention provides a laminate type dielectric device formed by alternately laminating dielectric ceramic layers and electrode layers, wherein the electrode layers ~~is~~ are made of an electrically conductive base metal material having a greater standard Gibbs free energy for the formation of a metal oxide at a baking temperature than that of a ceramic material constituting mainly the dielectric ceramic layers, and at least one of the electrode layers contains Mg as a component element.

Paragraph beginning at page 24, line 8 has been amended as follows:

First, even when MgO in such a small amount that cannot be detected by means of EPMA is added to the electrode paste, the existence of such a small

amount of Mg exhibits the effect of suppressing diffusion and segregation of the electrode material into the dielectric layers.

Paragraph beginning at page 24, line 14 has been amended as follows:

Second, the existence of the component element Mg provides a great effect of suppressing diffusion and segregation of the electrode material into the dielectric ceramic layers, and there is the possibility that sufficient performance can be obtained even when diffusion restriction is not promoted in all the electrode layers. For example, even when the suppression effect of diffusion and segregation is not promoted in one electrode layer among ten electrode layers, more excellent overall performance can be obtained than in the prior art devices because the other electrode layers restrict diffusion and segregation.

Paragraph beginning at page 24, line 34 has been amended as follows:

Next, a thirty-third aspect of the invention provides a laminate type dielectric device formed by alternately laminating dielectric ceramic layers and electrode layers, wherein the electrode ~~layer is~~layers are made of an electrically conductive base metal material having a greater standard Gibbs free energy for the formation of a metal oxide at a baking temperature than that of a ceramic material constituting mainly the dielectric ceramic layers, and wherein the Mg content per

unit volume in the electrode layers is greater than a mean value of the Mg content per unit volume in said dielectric ceramic layers.

Paragraph beginning at page 25, line 17 has been amended as follows:

Next, a thirty-fourth aspect of the invention provides a laminate type dielectric device formed by alternately laminating dielectric ceramic layers and electrode layers, wherein the electrode ~~layer is~~layers are made of an electrically conductive base metal material having a greater standard Gibbs free energy for the formation of a metal oxide at a baking temperature than that of a ceramic material constituting mainly the dielectric ceramic layers, and wherein the Sr content per unit volume in the electrode layers is greater than a mean value of the Sr content per unit volume in the dielectric ceramic layers.

Paragraph beginning at page 26, line 3 has been amended as follows:

According to a thirty-sixth aspect of the invention, the dielectric ceramic layers described above preferably comprise ~~consists of~~ PZT as an oxide mainly having a $Pb(Zr, Ti)O_3$ type perovskite structure.

Paragraph beginning at page 26, line 12 has been amended as follows:

Next, a thirty-eighth aspect of the invention provides an electrode paste material for forming electrode layers in a laminate type dielectric device formed

by alternately laminating dielectric ceramic layers and the electrode layers, wherein the electrode paste material ~~consists of~~comprises CuO as its principal component, and contains a melting restrictive material for restricting melting of a copper oxide to the dielectric ceramic layers during integral baking.

Paragraph beginning at page 27, line 17 has been amended as follows:

In the electrode paste material ~~consisting of~~ comprising CuO paste material to which the specific material is added, segregation and diffusion of the Cu-containing compound can be suppressed in the ceramic material because melting is restricted.

Paragraph beginning at page 27, line 22 has been amended as follows:

Next, a thirty-ninth aspect of the invention provides an electrode paste material for forming electrode layers in a laminate type dielectric device formed by alternately laminating dielectric ceramic layers and the electrode layers, wherein the electrode paste material ~~consists of~~comprises CuO as its principal component, and contains a melting point raising material for raising a melting point (e.g. eutectic point) of the copper oxide or a melting point of a compound between the copper oxide and ceramic material constituting said dielectric ceramic layers, or melting points of materials mixed in the ceramic material and the copper oxide during integral baking.

Paragraph beginning at page 28, line 3 has been amended as follows:

Next, a fortieth aspect of the invention provides an electrode paste material for forming electrode layers in a laminate type dielectric device formed by alternately laminating dielectric ceramic layers and the electrode layers, wherein the electrode paste material ~~consists of~~comprises CuO as its principal component, and contains a melting point raising material for raising a melting point of the copper oxide or a melting point of a compound between the copper oxide and ceramic material constituting the dielectric ceramic layers, or melting points of materials mixed in the ceramic material and the copper oxide during integral baking, and a diffusion restrictive material for restricting diffusion of the copper oxide into the dielectric ceramic layers during integral baking, the components of the diffusion restrictive material diffusing by themselves into the dielectric ceramic layers during integral baking.

Paragraph beginning at page 28, line 20 has been amended as follows:

When the electrode paste material according to the present invention is used, segregation and diffusion of the Cu-containing compound can be suppressed due to the rise of the melting point and restriction of diffusion, and the bonding strength between the electrode layers and the dielectric ceramic layers can be improved.

Paragraph beginning at page 28, line 26 has been amended as follows:

According to a forty-first aspect of the invention, the at least one of the dielectric ceramic layers described above preferably consists of PZT as an oxide mainly having a $Pb(Zr, Ti)O_3$ type perovskite structure.

Paragraph beginning at page 28, line 36 has been amended as follows:

For the same reason as described above, when the amount of the electrode layers exclusive of $CaCO_3$ or CaO is 100 wt%, it is preferred that $CaCO_3$ or CaO is contained within a range of an amount exceeding 1 wt% to 15 wt% calculated as CaO according to a forty-fourth aspect of the invention.

Paragraph beginning at page 30, line 35 has been amended as follows:

According to fifty-fourth and fifty-eighth aspects of the invention, the electrode paste material preferably contains a cooperative material ~~consisting~~ ~~of~~comprising at least one kind of the principal components constituting the dielectric ceramic layers. In this case, the bonding condition between the resulting electrode layers and the dielectric ceramic layers can be improved.

Paragraph beginning at page 31, line 5 has been amended as follows:

According to fifty-fifth and fifty-ninth aspects of the invention, the electrode paste material further preferably contains a cooperative material made of substantially the same material that constitutes the dielectric ceramic layers. In this case, the bonding condition between the resulting electrode layers and the dielectric ceramic layers can be further improved.